A SOLE ASSEMBLY FOR AN ORBITAL SANDER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a sole assembly for an orbital sander, and more particularly to a sole assembly that has a sole plate and a bearing, and the sole plate has an integral bearing seat to hold the bearing that holds a shaft of a motor.

2. Description of Related Art

Sanding machines also called sanders are generally pneumatically or hydraulically driven and are often used to treat or condition surfaces, such as smoothing, polishing and finishing a surface of an object. For example, a pneumatic sander, such as an orbital jitterbug sander, mainly comprises a pneumatic motor and a sole assembly. The pneumatic motor is powered by compressed air and has a shaft that is rotatably held in the sole assembly.

With reference to Fig. 4, in order to rotatably hold a shaft (not shown) of a pneumatic motor (not shown), a sole assembly in accordance with prior art comprises a bearing (51), a sole plate (52), a bearing washer (53), a separatable bearing housing (54), two sandpaper clips (55) and multiple screws (56). The sole plate (52) has a top (not numbered), a bottom (not shown), two opposite ends (not numbered), a central through hole (521) and multiple countersunk screw holes (522). The countersunk screw holes (522) are defined through the bottom and are respectively arranged with a ring around the through hole (521) and two straight lines respectively at the ends of the sole plate (52).

The bearing washer (53) is mounted on the top of the sole plate (52) and

has a central through hole (531) and multiple bores (532). The central through hole (531) of the bearing washer (53) aligns with the central through hole (521) in the sole plate (52), and the bores (532) align respectively with the countersunk screw holes (522) around the central through hole (521) in the sole plate (52).

The bearing housing (54) is mounted on the bearing washer (53) and has a bearing recess (541) and a flange (542). The bearing recess (541) has a top outer surface (not numbered), a bottom recessed surface (not numbered), a bottom annular edge (not numbered), a center and a shaft through hole (not numbered). The shaft through hole is defined through the center of the bearing recess (541). The flange (542) is formed at and extends radially out from the bottom edge and has multiple threaded screw holes (543). The threaded screw holes (543) are aligned respectively with the bores (532) in the bearing washer (53).

The sandpaper clips (55) are mounted on the top respectively at the ends of the sole plate (52), and each sandpaper clip (55) has an L-shaped mounting bracket (551). The mounting bracket (551) is attached to the top of the sole plate (52) and has multiple threaded screw holes (552). The screw holes (552) in each of the mounting brackets (551) are aligned respectively with the locking holes (522) in the line arrangement at the corresponding end in the sole plate (52).

The bearing (51) is mounted and held in the bottom recessed surface of the bearing recess (541) to hold the shaft. The screws (56) fasten the aforementioned parts together. The shaft of the pneumatic motor passes through the shaft though hole in the bearing recess (541) and connects to and is held by the bearing (51). The screws (56) are pass respectively through the countersunk

through holes (522) and the bores (532) in the bearing washer (53) and screw into the threaded screw holes (543, 552) in the flange (542) of the bearing housing (54) and the mounting brackets (551).

However, the conventional sander uses many parts including the bearing housing (54), the bearing washer (53), the screws (56) and the bearing (51) to connect the shaft to the sole plate (52). To assemble those parts requires much time and increases manufacturing cost. Likewise, the sandpaper clips (55) are attached with screws (56) and have a similar problem with similar consequences.

Since the sander oscillates to treat an object's surface, the oscillations and resultant vibrations in the sander may loosen the screws (56) eventually. The bearing housing (54) will separate from the sole plate (52) if the screws (56) loosen. The sander will break if the bearing housing (54) separates during operation.

To overcome the shortcomings, the present invention provides an improved sole assembly for connecting a shaft of a sander to mitigate or obviate the aforementioned problems.

SUMMARY OF THE INVENTION

The main objective of the invention is to provide a sole assembly for an orbital sander that has a sole plate with an integral bearing seat to hold a bearing in position such that the sole assembly can hold a drive shaft protruding eccentrically from a shaft of a pneumatic motor.

A sole assembly for an orbital sander includes a sole plate and a bearing. The sole plate has a top, a bottom, two opposite ends and a bearing seat. The bearing seat is integrally formed by forging or stamping, protrudes from the top

and has a top, a top opening and a bottom recess. The top opening is defined through the top of the bearing seat. The bottom recess is defined coaxially with the top opening in the bottom of the sole plate. The bearing is mounted and held in the bottom recess and connects to a drive shaft protruding eccentrically from a shaft of a motor of the sander. Therefore, the sole assembly has a minimum number of parts that reduces assembly time and lowers manufacturing costs.

Other objectives, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an exploded perspective view of a sole assembly in accordance with the present invention and a pneumatic motor;

Fig. 2 is a perspective view of the sole assembly and the pneumatic motor in Fig. 1;

Fig. 3 is a side plan view in partial section of an orbital sander machine with the sole assembly in Fig. 1; and

Fig. 4 is an exploded perspective view of a conventional sole assembly in accordance with the prior art.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

With reference to Figs. 1 to 3, an orbital sander (not numbered) mainly comprises a conventional pneumatic motor (20) and a sole assembly (10) in accordance with the present invention. The motor (20) has a shaft (21). The shaft (21) has an outside end (not numbered), an axis and a drive shaft (211). The drive shaft (211) is formed eccentrically on the outside end of the shaft (21) and has an

axis (not numbered), a distal end (not numbered) and a screw hole (212). The screw hole (212) is defined along the axis in the distal end of the drive shaft (211).

The sole assembly (10) connects to the drive shaft (211) and comprises a sole plate (11), two sandpaper clips (12), a washer (13), a fastener (14) and a bearing (15). The sole plate (11) has a top (not numbered), a bottom (not numbered), two opposite ends (not numbered), an integral bearing seat (111) and multiple in-line protrusions (114). The integral bearing seat (111) is integrally formed on and protrudes from the top of the sole plate (11) by forging, stamping or other means and has a top (not numbered), a bottom recess (112) and a top opening (113). The top opening (113) is defined through the top of the bearing seat (111) and has an annular lip (not numbered) extending inward around the top opening (113). The bottom recess (112) is defined coaxially with the top opening (113) through the bottom of the sole plate (11).

The bearing (15) is mounted and held securely in the bottom recess (112) to hold the drive shaft (211). The protrusions (114) are formed on the top of the sole plate (11) and are arranged in two lines respectively near the ends of the sole plate (11). The distal end of the drive shaft (211) passes through the top opening (113) and extends into the bottom recess (112) of the bearing seat (111). The drive shaft (211) is mounted and held securely in the bearing (15).

The fastener (14), such as a screw, passes through the washer (14) and screws into the screw hole (212) in the drive shaft (21) until the washer (14) abuts the bearing (15) to hold the drive shaft (21) in the bearing (15).

The sandpaper clips (12) are conventional and are respectively mounted

at the ends of the sole plate (11). Each of the sandpaper clips (12) has an L-shaped mounting bracket (121). The mounting bracket (121) has multiple mounting holes (122) aligned respectively with the protrusions (114) in one of the lines at the ends of the sole plate (11). The mounting holes (122) are mounted respectively around the aligned protrusions (114) to hold the sandpaper clips (12) in position. Thus, the sandpaper clips (12) can be attached to the top of the sole plate (11) by welding, such as high frequency heat welding.

Therefore, the sole assembly (10) in accordance with the present invention uses a minimum number of parts, which reduces assembly time and lowers manufacturing costs. In addition, the bearing (15) is held in the integral bearing seat (111) that is integrally formed on the sole plate (11) so that the bearing (15) is not inadvertently separated from the sole plate (11) even after long-term use. The sander is more durable than a conventional sander that uses a separable bearing housing and multiple screws to fasten the bearing housing to the sole plate.

Even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size, and arrangement of parts within the scope of the appended claims.